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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,660	01/27/2004	John H. Rosenfeld	H1799-00216	9808

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EXAMINER

DUONG, THO V

ART UNIT	PAPER NUMBER
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3743

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/765,660

Applicant(s)

ROSENFELD ET AL.

Examiner

Tho v Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 32-58 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31 is/are allowed.
- 6) ☒ Claim(s) 1-18, 20-23 and 25-29 is/are rejected.
- 7) ☒ Claim(s) 19, 24 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/13/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-49, drawn to an invention of a capillary structure, classified in class 165, subclass 104.26.
- II. Claims 50-58, drawn to a method of making a capillary structure, classified in class 419, subclass 2.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the capillary structure can be made by another and materially different process such as the process without the step of providing a slurry and drying the slurry to form a green wick or step of using a mandrel.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species of the claimed invention: the species are identified as the species of 1-18; 19-36; 44-51 and the non-illustrated species of sintered powders as claimed in claims 44-47 and 49.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Mr. Samuel W. Apicelli on 1/12/2005 a provisional election was made without traverse to prosecute the invention of group I, and species of figures

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19-36, claims 1-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 32-58 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3,5-12,14,21,22,23,25, 26,28 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 12 and 28, the limitation of “said metal particles that are constituent portion of said braze compound comprises a smaller size than said metal particles” renders the scope of the claim indefinite since it is not clear how “said metal particles” can be smaller than “said metal particles”. Regarding claims 9 and 25, the limitation of “said brazing compound is present in the range from about two percent to about ten percent” renders the scope of the claim indefinite since it is not clear whether applicant is claiming the weight percent over the wick structure or the volume percent over the wick structure or any other percentage of the brazing constituents over the heat pipe.

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Regarding claims 3,8-12,27 and 28, the limitation of “ brazing compound...gold particles”; “braze compound particles comprises about minus three hundred and twenty-five mesh” and “said metal particles that are a constituent portion of said braze compound” renders the scope of the claim indefinite since it is not clear if applicant is claiming the capillary structure, and the heat pipe as a final product or as an intermediate product, since as the final product, the brazing compound is no longer in particle shape but fillets and vice versa, as the intermediate product, the brazing compound is in particle shape but no fillets.

Claims 12 and 28 recite the limitation "said metal particles" in lines 1 and 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 5-7,10,14,21-23,26 and 30 recite the limitation "said plurality of metal particles" or “said metal particles” in lines 1. There is insufficient antecedent basis for this limitation in the claim.

The examiner has not able to determine whether claims 3, 8-12,25,27 and 28 are new or inventive in view of the clarity issues above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2,4-7,13-18,20-23 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshizumi (JP 359024538A) in view of Corman et al. (US 3,828,849).

Yoshizumi discloses (figures 1-4) a heat pipe comprising a wick (2,4) disclosed on at least one of the internal surfaces and comprising a plurality of copper particles (2) joined together by a silver alloy brazing compound such that fillets (4) of the brazing compound are formed between adjacent ones of the plurality of copper particles so as to form a network of capillary passageways between the particles; the spherical copper powder (2) inherently has a melting point as claimed and the silver has a melting point lower than the melting point of copper.

Regarding claim 15, a heat pipe as known in the art, is to have a hermetically sealed and partially evacuated enclosure so that water or other two phase liquid contained in the heat pipe to perform a cycle of evaporation and condensation. Evidence is shown in Katayama (US 3,921,710).

Yoshizumi does not disclose a plurality of vent being defined through the capillary structure.

Corman discloses (figures 1-3 and column 2, line 65- column 3, line 1) a heat pipe that has a plurality of cylindrical vents (28) defined through a capillary structure (25) for the purpose of providing a low impedance path to the passage of vapor there through so that the heat transfer coefficient of the heat pipe is increased. Since Yoshizumi and Corman are both from the same field of endeavor and/or analogous art, it would have been obvious to one having ordinary skill in the art, at the time the invention was made to use Corman's teaching in Yoshizumi's heat pipe for the purpose of providing a low impedance path to the passage of vapor there through so that the heat transfer coefficient of the heat pipe is increased. Regarding claims 14 and 30, applicant has not disclosed that having a particular material of aluminum and magnesium would solve any stated problem or is for any particular purpose, applicant has not disclosed any criticality for

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having the claimed material. Moreover, it appears that the wick structure would perform equally well with any brazing compound that has less melting temperature than the metal particles.

Accordingly, the use of aluminum and magnesium is deemed to be a design consideration, which fails to patentably distinguish over the prior art of Corman and Yoshizumi.

Claims 1-2,4-7,13-18,20-23,26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staudhammer et al. (US 3,762,011) in view of Corman et al. (US 3,828,849). Staudhammer discloses (figures 1-2) a heat pipe comprising a wick (18) disclosed on at least one of the internal surfaces and comprising a plurality of copper particles (20) joined together by a polymer brazing compound such that fillets (24) of the brazing compound are formed between adjacent ones of the plurality of copper particles so as to form a network of capillary passageways between the particles; the spherical copper powder (20) inherently has a melting point as claimed and the polymer has a melting point lower than the melting point of copper; and the powder has a mesh size in the range of 50-200. Staudhammer does not disclose a plurality of vent being defined through the capillary structure. Corman discloses (figures 1-3 and column 2, line 65- column 3, line 1) a heat pipe that has a plurality of cylindrical vents (28) defined through a capillary structure (25) for the purpose of providing a low impedance path to the passage of vapor there through so that the heat transfer coefficient of the heat pipe is increased. Since Staudhammer and Corman are both from the same field of endeavor and/or analogous art, it would have been obvious to one having ordinary skill in the art, at the time the invention was made to use Corman's teaching in Staudhammer's heat pipe for the purpose of providing a low impedance path to the passage of vapor there through so that the heat transfer coefficient of the heat pipe is increased. Regarding claims 14 and 30, applicant has not disclosed that having a

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particular material of aluminum and magnesium would solve any stated problem or is for any particular purpose, applicant has not disclosed any criticality for having the claimed material. Moreover, it appears that the wick structure would perform equally well with any brazing compound that is less melting temperature than the metal particles. Accordingly, the use of aluminum and magnesium is deemed to be a design consideration, which fails to patentably distinguish over the prior art of Corman and Staudhammer.

Allowable Subject Matter

Claims 19, 24 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 31 is allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mizuhara (US RE. 35,521) discloses a brazing alloy of copper.

Borchert (US 4,101,691) discloses an enhanced heat transfer device.

Tajima (US 5,632,158) discloses a tubular heat pipe with fins.

Eastman (US 4,274,479) discloses a sintered grooved wicks.

Grant (US 3,821,018) discloses a porous metallic layer formation.

Garner et al. (US 20040211549A1) discloses a sintered grooved wick with particle web.

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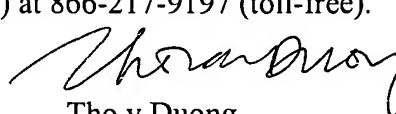
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tho v Duong whose telephone number is 571-272-4793. The examiner can normally be reached on M-F (first Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet can be reached on 571-272-4791. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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January



Tho v Duong
Examiner
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